TED STATES DEPARTMENT OF LABOR
FRANCES PERKINS, SECRETARY
WOMEN'S BUREAU
MARY ANDERSON, DIRECTOR

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The Industrial Nurse and The Woman Worker

By
JENNIE MOHR

SPECIAL BULLETIN NO. 19 OF THE WOMEN'S BUREAU

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1944

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.
Price 10 cents

LETTER OF TRANSMITTAL

UNITED STATES DEPARTMENT OF LABOR,
WOMEN'S BUREAU,
Washington, May 24, 1944.

MADAM: I have the honor to transmit a report analyzing both broadly and in detail the widening field of responsibility on the part of the industrial nurse and the vital importance of her being informed as to working conditions, actual and desirable; occupational hazards and accident prevention; plant service and food facilities; the personal problems that lower women's efficiency on the job; and other developments of the war years.

It is being increasingly recognized by employers, industrial physicians, industrial nurses, and workers that the nurse has a great opportunity to help in the solution of such problems and in the education of workers in matters of health and safety. This report is directed particularly, therefore, to nurses in industrial plants; but it is hoped that the presentation of some of the factors involved in the employment of women will be of use also to those in such departments as personnel, safety, and training.

The report is the work of Jennie Mohr, of the Bureau's Research Division.

Respectfully submitted.

MARY ANDERSON, *Director.*

HON. FRANCES PERKINS,
Secretary of Labor.

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The Industrial Nurse and the Woman Worker

I. THE WOMEN COME TO THE NURSE

From the towns and from the farms, from homes and shops and offices, women are coming into war plants to make the machinery of war. They are building tanks and planes and ships and guns. Much of the work is strange to them, but there is no question about the effectiveness with which they are doing it. As men are being transferred to military service, women are filling the gaps in industry in increasing numbers. They are spreading into jobs that a few years ago no one would have expected them to fill. Some of these jobs are fairly light and obviously suited to women's physical abilities and experiences. Others are heavy, dirty, and sometimes dangerous. All of them, if war production schedules are to be maintained, require regular attendance and efficient performance.

At the same time, for the sake of the women themselves, their safety must be preserved and their health guarded. Thus the need for careful consideration of the well-being of women workers is twofold. It arises from the demands of war and from the need to protect the lives and the health of workers. These two needs are really one and the same; good performance cannot be given by sick or injured workers.

When women come into industry, new problems arise that were not there before. Some of these problems always arise among women workers, regardless of where they work. Others are peculiar to the job or the industry and, in cases of occupations unusual for women, are arising now for the first time. Here are a few of them:

1. Most of the women now coming into the plants are inexperienced, particularly inexperienced in the kind of work they are to do. Two factors make this a special problem: First, because most women have had not even casual experience with machines and tools and are unfamiliar with mechanical things and terminology, they are likely to feel greatly at a loss, at the outset, in dealing with such matters. Second, they find the factory environment strange and difficult to become adapted to. The size, noise, movement, confusion, often are overwhelming. Especially for the housewife coming into a factory for the first time, the importance of such things looms large. She has been used to working hard and steadily, but it has been independent work, at her own pace, according to her own plan, and in the security of her own home.

2. When women first came into war jobs they were carefully selected. Especially, age limits were set; often 18 to 35 years, or 20 to 40, was considered not only the most desirable but the only suitable age group. Gradually this idea was given up, partly because there were not

enough women of these ages, partly because it was discovered that a woman past 40 is able to hold her own on many jobs. Now in many places there are no age limits at all. This change not only opens opportunity to older women; it places more responsibility on management in the selection of women, responsibility to see that in employing older women they still preserve good health standards. At the other end of the age scale, the introduction of young girls into factories also brings new problems. These girls, many of whom are now undertaking their first job, have no experience to guide them in handling themselves and their work. They have little or no maturity of judgment that might help them to adjust to the environment; they have no knowledge of what is to be expected of them or what they may expect of others.

3. Many of the women are married, have homes and children. Frequently they have no relief from their home responsibilities when they start in on a factory job. Consequently, they are doing two jobs at once. On top of a full day's work in industry, they must run the home, prepare meals, care for children, do the shopping and the mending and the innumerable other household tasks. What does this double burden do to their efficiency on the job? How does it affect their health and their staying ability? To what extent should the plant nurse undertake to aid them in dealing with these questions?

4. An obvious problem is that of the physical capacities and requirements of women. Though of course there are wide differences among women, they have on the average a little over half the physical strength of men. This means that generally they cannot do, unaided, the heavy lifting, carrying, pushing, and pulling that some jobs require. Their structure is different—on the average their height is less than men's, their hands and feet are smaller, their muscles, especially of the feet and legs, are quicker to tire. Therefore, the suitability of equipment that ordinarily is used by men must be considered. Are tools too large to grasp or too heavy to wield?

5. It is sometimes as much of a problem to get the factory adjusted to the women as to get the women adjusted to the factory. There is scarcely a corner of "man's world" that is not being invaded by women. And naturally enough this is hard on the men. Consequently, they are likely often to resist the invasion—resist it by means of hostility and refusal to accept the women workers. Natural though such an attitude may be, it has of course no place in the present scheme of things; and the men—workers, supervisors, sometimes top management too—must be helped to understand that fact. In the meantime, the women are faced with this situation, and it is obvious that, on top of their general industrial inexperience, it adds another problem to be considered.

All these factors affect the production of the women workers. It would be the height of unwisdom to ignore them—especially when, with understanding and vision, they can be handled. In the course of this study other questions that affect similarly the success of new women workers will be mentioned. In general, it may be asked at this point: What is to be done about these problems?

Particularly, the question is: What can be done by an industrial nurse who is concerned immediately with the health of the workers in the plant? How can she best help to assure the maximum effi-

ciency of these new women workers? Most obvious is her place in the medical service of the plant, her special concern for the injuries and illnesses that arise in the course of the day's work. But whatever the specific task, the nurse is in a position to give the women guidance. This does not mean assuming responsibility for their personal problems, or for their relationships within the plant, or for their difficulties on the job. But because of the nurse's role in the organization, women turn to her for help. It may be well to examine in some detail the particular places in which her help is asked, and how such requests fit in with her job in the plant.

Industrial nurses are different. The very fact that they function in the plant dispensary or hospital or first-aid station rather than in a hospital or private home is a major cause of the difference. This setting, and the immediacy of the sources of injury or illness, cannot be ignored. Industrial nurses are on the spot, in the plant. Right before their eyes are the sources of trouble; they are in a position to see what these sources are.

Again, the health problems that come to the nurse often are directly related to many factors, in both work and home. These factors, which will be discussed in some detail later, may have to do with the physical demands of the job or with the working environment; with the routine of factory regulations; or with health or other problems within the home. They are the matters on which women go to the nurse for guidance, and they affect very directly the performance of the women on the job. The nurse's function, then, is something in addition to that of a hospital nurse, because she is confronted with nonmedical problems that directly affect the health of the workers and their productivity.

Among employers, industrial physicians, and industrial nurses, it is becoming widely recognized that the nurses have this widening field of work. Industrial medical practice is developing increasingly a preventive program; it is designed to keep people well, not only to cure them after they become ill. Consequently, stress is being put on the part that the nurse can play in helping with this prevention program. At the end of this pamphlet is a list of references to articles by industrial physicians and nurses that clearly state this purpose.

The specific points at which guidance is needed, and can be given by the nurse, will be discussed in the pages following. Here are a few examples:

> Margaret C. works on the graveyard shift. She is married, but has no children. She keeps house, which is not an excessive burden on her because it is in a small apartment and her mother lives near enough to come to the rescue in case of emergency. But Margaret C. is subject to severe headaches. She has had them for years and since she came to the plant they have increased in frequency and intensity. The doctor told her that she is not getting enough rest, not enough sleep, and that she is not eating the right food. But how can she? She has been on the job for 3 months but still has not learned to sleep well in the noise of the day; and she cannot get into proper eating habits in the topsy-turvy schedule of the night shift. She has been staying away from work—2 days this week, 1 last week, 3 days the week before.
>
> Margaret goes to the medical department for some anacin, hoping that it will make her feel better able to stay the night through. She tells the nurse about the headaches, the irregular, sketchy, pick-up meals, the strain of working nights and trying fruitlessly to sleep days. "What shall I do?" she asks.

Frances R. operates a couple of grinders in the tool-grinding department. She sharpens drills: Small drills, sometimes no larger than an embroidery needle, on the rotary grinder; larger ones, perhaps two inches or more in diameter, on the rocker grinder. Frances stands at the job all day; and even though she is provided with a wooden platform to keep her feet off the cold cement floor, she gets pretty tired.

Frances finds her way to the nurse's office, too. "I've been menstruating twice as long as usual since I've been on this job," she says. "I've always suffered a good deal of pain, but now it seems worse than ever. I think standing all day has something to do with it. And besides, those tote boxes are pretty heavy when I have to return the drills and fetch new ones. I know I've been told not to lift too much; but on a day like this almost anything is too much. What can I do about it?"

Ruth M. is 35. She has been working in the plant for about 6 months, and has talked with the nurse—once when she had a slightly cut finger and once for a few minutes in the women's rest room. The nurse remembers thinking what a capable, sensible, attractive woman she seemed.

Now she goes in with a pass from her foreman and asks the nurse to countersign it. She is ill, and wants to go home. "No, nothing particularly wrong; I've just got a terrible headache, and I can't stay." She looks very distressed, and the nurse wonders if it is just a headache. And before long Ruth begins to talk. She really has a headache, but that is the effect, not the cause. "My mother simply can't be left alone in the house any more—she is too sick; I am always terribly afraid something will happen to her while I'm at work. She needs a doctor's care, and maybe she should be in a hospital—I just don't know. Most nights I am up taking care of her, and I'm all worn out and don't know what's best to do."

Mary C. goes storming into the dispensary. "Can you give me something for a cold—I'm getting a nasty one, the third I've had in the 2 months I've been here. I tell you, that room is so drafty and cold I don't see how anyone keeps well in it. And when I put on my sweater the safety inspector comes along and tells me it's dangerous to wear it around my machine. So I either freeze or get caught in the press. I don't know which would be worse."

Not only the health of the women but their performance in the plant depends in some measure on what the nurse does about these women who go to her for help. She can get at the reasons why they are absent, or quit their jobs. She, perhaps better than anyone else, can discover from them conditions within the plant that hamper their production, conditions that might well go unrecognized or ignored by the supervisors who are concerned with getting out the product of the plant. She can help these supervisors to increase that output by helping to remove some of the things that slow it up. This bulletin is the story of such opportunities in a nurse's job, and some of the ways in which she may take advantage of them.

II. GETTING TIRED OUT

Women come into the dispensary and complain of being "too tired to work." Or they show signs of "wearing out," and sometimes quit their jobs because they can no longer stand the strain. Still other women keep going but have to make more and more of an effort to do so; or their production slows down; or the number of their accidents or illnesses increases. These changes may be signs of fatigue. To help the women to remain well and be effective workers, the nurse must know what is the basis of their inability to carry on their work. The following paragraphs point out some of the causes she may discover. Some of them she can deal with directly; others can be removed only by winning the understanding and cooperation of supervisors, management, or other agencies. In all cases her first need is *to know why.*

A great many studies have been made of the fatigue of industrial workers. From them one significant fact has arisen clearly. This is, that there is no simple element, fatigue, that can be recognized and isolated and measured. Rather, fatigue is a word that is used to describe a whole group of conditions, both within the worker and in the environment. Some authorities hesitate to use the word at all, because it means too many things. But often it can be applied usefully to the situation in which a worker's ability to stay steadily on the job, and do a full day's work, becomes gradually lessened. The concern here is with some of the conditions in the environment and the job that might help to bring on this situation.

Dr. Alice Hamilton, an outstanding authority in the field of industrial medicine and formerly of the Harvard Medical School, puts it this way (1):[1]

> For a long time industrial fatigue was considered a rather simple problem, something for physiologists to determine by chemical or mechanical tests that could be applied to workers in the field just as well as to laboratory subjects, but the more the problem has been studied, the more complicated it has been found to be. Fatigue is influenced not only by hours of work but by other environmental factors, such as long or short periods of uninterrupted work; by heat, cold, humidity; by lighting; by posture; by the worker's skill or lack of skill; and by the worker's mental attitude toward his job and his pay, his fellow workers, and his supervisors.

Others have shown that still more factors are involved than those mentioned by Dr. Hamilton. These various causes act on the worker's mind as well as his body. Dr. R. R. Sayers, director of the Bureau of Mines, United States Department of the Interior, points out (2) that—

> Environmental conditions and relations with management and fellow workers are more important factors in fatigue than physical activity except in the "heavy" industries that require hard physical labor.

It is neither necessary nor possible to explore here all the factors that create fatigue. But some of the more obvious reasons why women find themselves tired out may be indicated.

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[1] References in parentheses throughout this report are to "Sources Referred to in Text," p. 44.

Long hours of work.

It is recognized generally that excessive hours of work, required over long periods of time, are a health hazard. It is not known how long a workday is the best for women, producing the most work of best quality with least exhaustion. But many studies that have been made indicate that fatigue arising from a long workday may be a serious obstacle to sustained and efficient work.

Dr. Isador Lubin, United States Commissioner of Labor Statistics, says (3):

> It can be proven by medical evidence that the amount of fatigue increases at a more than proportional rate as you go beyond a certain number of hours a day * * *. There is evidence to show that the eighth, the ninth, and the tenth hours do not result, in many industries, in as much output per man as any of the first 6 or 7 hours.

There are other factors besides production that appear to be related to the length of the working day or working week. Among them are the amount of spoilage, lost time, rate of accidents, and turn-over. Of these, the factors that would most easily come to the nurse's attention are lost time—especially that due to illness—and the rate of accidents. One of the studies by Dr. H. M. Vernon, eminent British authority (4), indicates that increasing the hours of work produces a greater increase of accidents among women than among men. In a group of women workers in a munitions plant he found that the number of cuts suffered in a 12-hour day was nearly 2¾ times that in a 10-hour day, whereas among men the number was increased by only 14 percent. This cannot be taken as a certain measure of fatigue, however, as other elements may be involved. But if the nurse finds that any of these factors, such as absenteeism, accidents, or turn-over, are serious among the women in the plant, she should consider whether they may be due to long hours of work. Her records of the women coming in for attention will furnish useful evidence in showing the effects of a fatigue that may be caused by too long a working day or week. Standards recommended by government agencies (3) include an 8-hour day, 6-day week, adequate meal period, and vacations.

Posture.

That poor posture plays an important part in the development of fatigue has been shown by many who have studied the question (5). Correct posture depends on two things: Sitting well, and having the right kind of chair to sit on. Of course it is possible to sit correctly on anything—a box or boards, for example. But it takes a good deal more effort to do so than if one has a properly designed chair.

Dr. J. R. Garner, an authority on posture, describes (6) the close relation between posture and fatigue. He points out that a slouched posture impedes the action of the heart, the circulation of the blood, and the processes of elimination. It puts pressure on the abdominal organs and may help to bring about displacement of the generative organs.

The encouragement of proper seating, both by explaining to the women the need for good posture and by convincing management of the need for good seats, is one important way in which the plant nurse can contribute to the relief of fatigue of the women workers. It has been shown that continuous sitting, as well as continuous standing, is

tiring. Many jobs can be done in either position, but often it is found that the women in such jobs are always standing or always sitting. Alternation should be encouraged wherever it is possible.

In a study of the fatigue of 325 workers Dr. Vernon (7) says:

> * * * Of the 325 workers * * * half complained of bodily fatigue. A quarter of the complainants said that they "felt tired all over," whilst a third of them felt tired in the back, neck, and shoulders. This seemed to be due to their working continuously in a sitting posture, for the operatives who had to stand whilst working frequently complained of fatigue in the legs. The fatigue felt by the two groups of workers would have been considerably reduced if they had sat and stood alternately at their work, for 86 percent of them stated that they preferred such an arrangement to a fixed posture.

Home responsibilities.

It is an oft-repeated story that women with homes and children to care for face a double responsibility when they take an outside job in addition. Indeed, a large part of the difficulty that women have in keeping going, day after day, may be explained by the fact that their hours away from work are filled with duties that allow insufficient time for recreation, rest, and sleep. This is true not only of married women with children, but of others who also have home duties and perhaps have dependents as well.

In most communities there are various agencies established to provide services for residents of the community. A nurse can inform herself as to what these agencies are in her own region and help the harassed worker to get aid from them.

Monotony.

One of the features of the large-scale employment of women in industry today is that many of their jobs are of an extremely simple and repetitive nature. In fact, to be able to use these inexperienced workers quickly it has been necessary to break down many of the more skilled jobs into very simple parts, and to train the women to do only one or a few of these parts.

The extent to which the monotony of such work tires the women depends largely on the individual; one man's meat is another man's poison, and the job that seems completely satisfactory to one woman may build up in another a restlessness or a tension that results in extreme fatigue. One writer points out (8) that boredom is experienced less when a job is fully automatic than when it is only semiautomatic. If it is such as to demand practically no concentration or attention, the worker can do it and keep her mind (and perhaps her conversation) on other things. But when it takes enough concentration to prevent this mental relaxation, and at the same time not enough to catch and hold the interest, then it is truly monotonous. The same situation is described by Dr. Hamilton (9):

> Unskilled work is on the whole more fatiguing than skilled, because it does not occupy the worker's mind. A man who has to think about his work is less susceptible to fatigue. With the introduction of the machine there often comes a loss of initiative on the part of the employee, who is, it is true, expected to work faster and to control more and more complicated machinery but whose work, even to individual motions, is planned in detail for him. His interest in it is apt to be lost very soon in boredom. On the other hand, if work is so completely automatic as to require almost no attention, it may not be boring because the worker can talk or day-dream as he pleases. It is in semiautomatic work, of a repetitive kind, that fatigue from boredom is most common.

The answer to the question of fatigue caused by monotony is frequently found to be in short rest periods. A number of plants introducing rest periods found that they were helpful not only to those workers who needed the time because of the heavy work they were doing, but also to those who needed a change from light, repetitive work. Dr. Hamilton remarks (10) that—

> The effect of too long hours on repetitive work is shown most clearly in the mental attitude of the worker, which is one of bitter, pessimistic preoccupation, and by irregular attention to the work. This attitude was found to disappear in the majority of cases by the simple expedient of breaking the monotony and lessening fatigue by rest periods.

Physical environment.

The physical conditions of work play a large part in preserving or diminishing a worker's staying-power on the job. Some of the important factors are these:

Lighting.—Thirty-nine percent of all workers of 30 years of age are handicapped visually (11). This means that not only the older worker, whose vision may fail with his years, needs the protection of good lighting, but others as well. The American Standards Association Recommended Practices bulletin points out that even those with perfect vision "find, under good lighting, a noticeable improvement in eye comfort which results in reduced fatigue." (12)

The advantages of good lighting listed by Allen D. Brandt and Harry E. Seifert (13) include, among others: Greater ease of seeing, especially among older employees, thus making them more efficient; less eyestrain; and improved morale.

Noise.—It is well known that a noisy environment is conducive to fatigue. A study of "Noise and Its Effect on Human Beings" (14) indicates that there is also danger of actually impairing the hearing, and that the efficiency of workers may be diminished in a noisy environment. The Bureau of Women in Industry of the New York Department of Labor has studied the effects of noise on the hearing of industrial workers (15), and recommends that tests of hearing and periodic examinations be made where workers are exposed to excessive noise.

Dr. Vernon points out (16) that individuals vary greatly in the way they react to excessive noise, and that some attempt should be made to discover which workers are particularly susceptible and likely to develop nervous symptoms when so exposed.

Brandt and Seifert (17) list four ways of reducing or eliminating the hazards of noise: (1) Elimination of noise at its source, (2) isolation of noisy operations, (3) reduction of noise by sound insulation, and (4) the use of personal protective devices against noise.

An awareness of these possibilities, and knowledge of the apparent effects of noise on individual workers, will help the nurse to encourage the proper steps to be taken against this hazard.

Ventilation and heating.—The importance of uncontaminated air and suitable temperatures in which to work is obvious. Not only is it necessary to protect the workers exposed to special hazards, such as dusts, fumes, gases, and vapors, or to extremes of cold and heat; steady efficiency and continued good health require for all workers surroundings that maintain recognized standards of ventilation and heating. Discovering what these standards are, and seeing that they

exist in the plant, are the responsibilities of both safety and medical departments. But when the women go to see the nurse because of a cold, or a sore throat, or because they find they have to spend time and energy fighting an uncomfortable environment, she can do a lot by discovering the extent to which unsuitable air or unhealthy temperature contributes to their special difficulties.

With respect to all the factors that make up the physical environment of the worker, the nurse can exercise a similar watchful control. She can call to the attention of the responsible officials the conditions she has reason to believe are causing discomfort or illness, and urge that they be remedied.

Night work.

The conviction is general that night work is undesirable for women. However, in view of the widespread use of three 8-hour shifts during the war, and the not uncommon system of shift rotation, it is not practicable to set up a standard that invariably excludes women from night work. What can be done is to keep an eye open for the evidences of fatigue or mental or physical disturbances appearing as a result of night work.

It should be remembered, when shifts are rotated, that sufficient time must be allowed on each shift to permit the women to make adjustment to it. Rotation in periods of less than one month are for this reason too frequent. Two or three months probably should be the minimum length of time on each shift.

The disadvantages of both shift rotation and continuous night work are discussed by Dr. Beatrice Mintz in the New York State Industrial Bulletin (18), in which the "evidence offered by physiologists on the difficulty of changing sleeping and eating habits, making shift rotation a hazard to health and a factor in reduced output," is balanced against "the well-known observations of increased fatigue on night work and the social isolation experienced by the night workers themselves."

It is especially important to keep in mind the fact that the women who are carrying on household duties are more subject to fatigue as a result of night work than are men or women without such duties; they are likely to run the household during the day when they should be sleeping. Consequently it is important for the nurse to know the conditions faced by the women on night shifts, to determine on an individual basis their ability to do night work, and to inform the supervisor assigning shifts about the women who, for such reasons, should be kept off night work. The health and efficiency of the individual, as well as such factors as equal distribution of night work, seniority, and the like, must be considered in determining a valid basis for working at night.

Personality factors in fatigue.

Pushing a button, manipulating a gage, winding wire—whatever the process on which a woman is engaged—is only a part of "the job." She is one of a group, often a very large and miscellaneous group. She spends 8 hours a day not only doing work but doing it with or among other people. And her relationship with these other people has a good deal to do with how tired she gets on the

job. The scientific study of fatigue made at a Western Electric Co. plant (19) gives much evidence showing that such factors may have as much or more to do with creating fatigue as the actual physical strain, or even the monotony, of the work itself.

A well-known British industrial physician, Howard E. Collier, has pointed out (20) that fatigue may develop when a good deal of energy must be expended to counteract the effects of the environment. He adds:

> It is for this reason that a cold shop, a nagging foreman or unhappy group relations in a workshop are found to be fatiguing by the worker.

In protecting the worker against fatigue, it is important to know the psychological factors that produce fatigue. Collier points out that—

> * * * it is just "conditions of work" that lessen *emotional* fatigue that are of special importance in preventing industrial fatigue. Lack of sleep or insufficient rest are powerful causes of fatigue because they prevent or delay the restoration of depleted reserves of emotional energy. Moreover, it is recognized that * * * a feeling of insecurity is more fatiguing than indifferent ventilation * * *.

In many cases help for the new woman worker in adjusting to her job must be continued throughout her work experience. The need for this arises largely from two facts. One is that her attitudes—toward supervision, training, discipline, and regularity of work habits—do not always fit in easily with the factory environment, and she must learn to make them do so; the second is that she is likely to carry with her to work the worries and problems that face her outside. It is easy to see that the added strain of these factors contributes in no small part to her fatigue. Therefore it is important to learn the extent to which the women coming into factory work are having to deal with such problems, and how much they affect their ability to work steadily and efficiently.

Whatever the causes of fatigue, the extent to which it occurs in a plant is measured by what happens to the workers. This practical test is the nurse's best means of discovering when factors, personal or environmental, are threatening the well-being and efficiency of the women in the plant. If she watches for the first signs of fatigue, the nurse can eliminate or diminish its causes before they lead to illness, absenteeism, and separations.

III. EVERYDAY GOOD HEALTH HABITS

The work of a nurse in a plant may be confined within the 8 hours of a working day and the gates of the plant property. But actually what she does finds its way into the lives and homes of the workers and their families.

She can help workers to guard against many of the health hazards that threaten to impair their usefulness on the job as well as their security outside. To the worker, the foresight of this nurse is of enormous value. It protects the worker's ability to stay on the job, to produce, and to maintain economic security. It means steady performance and steady wages; less to pay out for curing ills, because there are fewer ills to cure; freedom from the psychological and physical drag of ill health.

The benefit to the employer of such aid on the part of the nurse is equally obvious. It means a healthier and steadier working force; it means less absenteeism and turn-over, smoother flow of work, better production.

That this responsibility of the industrial medical department is commonly recognized is reflected in the words of Dr. C. O. Sappington (21), widely known industrial-hygiene authority:

> It has been repeatedly stated that the progress of the safety movement was greatly accelerated by "selling" every employee the idea that the safe way is the best way. This has its analogy in "selling health," and it is a fundamental principle that the employee must be convinced that good health or at least a fair degree of it is a basic principle upon which continuous earning capacity is founded. * * * the employer wants to continue his production as near the peak as possible; * * * the employee wants to continue to earn his wages without interruption. At the convergence of these two desires stands the field of industrial health through which these desires may be accomplished.

Dr. Sappington goes on to explain why it is important for the worker to acquire health information easily—which should mean, in large measure, to get it at her place of work. The industrial nurse in the plant is in a strategic position to give it. The worker who goes to the first-aid station or dispensary is, as one writer puts it, psychologically ready to receive instruction. The nurse can take advantage of the immediate concern—a cut finger or a skin eruption, for example—to direct the talk to general health care.

It is worth while to look at Dr. Sappington's reasons why it is important to give the workers health education (21):

> It is impossible to entirely separate the personal health of the employee from the purely industrial phases of health. As a matter of fact, personal health is indeed a part of industrial health work. It is further evident that no matter what provisions are made for the protection of the health of the employee within his working hours, any individual can upset his program of protection within industry by what he does outside of his working hours. It therefore becomes necessary to provide some way by which the employee may be informed concerning his personal health.

> It is surely fruitless and a waste of money and time to provide expensive equipment and extensive health service staff, unless the cooperation of employees can be secured in availing themselves of the opportunity of this service. This involves the continuous use of carefully gathered and widely disseminated health information.
>
> Where health service has been inaugurated, it is necessary that a constant program of encouragement to make use of the facilities of the health service be promoted among the employees. This calls for constant reminders regarding the importance of health and the principles of keeping well, and the fundamentals of health training.

Good health certainly is of equal importance to men and to women. But in many of the practices that preserve and increase health, the attitude and the activity of a woman may be of more consequence. She is likely to be the one primarily responsible for running the home, preparing meals, looking out for the well-being of her family in terms of practical, everyday duties. She is in a position to apply at home, as well as on the job, the principles of good health which the nurse in the plant is able to give her.

These principles, if they are to be useful, must not be elaborate or difficult to follow out. The way in which they are presented should be, as one authority has said, "simple, direct, practical, and brief" (22). It must be in language easily understood, and must not involve more than a working woman with a family to care for can be expected to do.

Good health rests to a large extent on good everyday habits. Most people are likely not to bother about such things until something goes wrong. The idea of preventive health measures is not firmly rooted in the average person's mind. It is part of the nurse's job to make that idea become so constantly present in the minds of the women in the plant that they not only will get well but will stay well.

Ways and means for conveying this necessary health information to the workers, and for getting them to realize its importance to them, will depend on the plant's attitude toward health education, and will vary with the size of the force and the amount of work to be done. In some plants nurses remain constantly on duty in the dispensary; and as the women come in to have ills and injuries taken care of, or to ask advice or talk over some special problem, the nurse can take the occasion to interest them in questions of health. In other plants, one of the nurse's duties is to visit the places where the women are at work, or their rest or lunch rooms, to keep an eye on the conditions under which the work is done and the cleanliness and efficiency of the service facilities. Such occasions offer the nurse a chance to know the women, even those who do not come to the dispensary, and to arouse their interest.

Again, a plant may have an educational program, which begins with the introduction of new workers into the plant and continues after they are on the job. Such programs, which may stress special problems for women, must be the result of cooperation among various departments, such as safety, medical, cafeteria, personnel, industrial relations. (See pt. V.)

A few major points on which "selling health" to the women can be focused are these: Nutrition, personal hygiene, health in the home, and mental hygiene.

We are what we eat.

From the cradle to the grave, a person is to a large extent formed by the food he eats. Dr. H. M. Vernon puts it strongly when he says (23):

> We have good reason to think that of all the environmental influences reacting upon the child before and after birth, upon the school child, the adolescent, and the adult, nutrition plays the largest part. It controls growth and physique, it largely determines physical and mental health, and the capacity for avoiding and overcoming disease.

That most of us have not been properly respectful of this power of food is recognized by the many health authorities who have become increasingly concerned with the health protection of workers, in normal times and especially now with the increased pressures that war has brought. For example, a report of the National Research Council (24) shows that among employed workers' families in various parts of the country, only 26 percent were classed as having good diets; 45 percent had fair and 26 percent had poor diets. The standards used in this study were lower than those of the Food and Nutrition Board of the National Research Council. If the latter had been used, the results would have been even less favorable.

As far as women themselves are concerned, it is recognized that the diets of women workers generally are poorer than those of men workers. It has been pointed out that this situation is of increasing significance as greater numbers of women go into industrial work. One manager of a chemical plant in England found that his women employees had much higher incidence of gastric complaints than the men but that this sex difference disappeared after the diets of the women were improved (25). Dr. Frank G. Boudreau, chairman of Food and Nutrition Board and Committee on Nutrition in Industry, National Research Council, points out (26) that there are three ways in which food deficiency can be dealt with: The first is education—workers cannot improve their health through proper eating unless they know what to eat; second, supplementing inadequate diets, a practice carried on in a number of plants; third, enriching staple foods so that one can get from them some added essential nutrition.

Of these three ways, two are of immediate concern to an industrial nurse. First, through her personal and constant contact with the men and women, she can help in teaching them what they should know about food; and second, by cooperation with those responsible for food facilities of the plant she can see that necessary kinds of food are available to the workers.

Nutrition education.—As the National Research Council report points out (27), the most pressing need in the campaign to safeguard nutrition and promote health and efficiency is greater knowledge about food requirements on the part of every person. To aid in giving this knowledge, Government agencies, research foundations, and private concerns have done a great deal within the past few years to explore the nutritional needs of workers and to publish material that can be used in the fine art of persuasion.

The Civilian Food Requirements Branch of the Office of Distribution, War Food Administration, has developed material for health education programs for workers as well as programs for plant techniques in supplying food. This organization also has a field service,

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which helps plants to establish food services and to secure food supplies, equipment, and personnel. Regional headquarters of the Office of Distribution from which such help can be obtained are these:

Northeast Region: 150 Broadway, New York 7, N. Y.
Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia.
Southern Region: Marietta and Forsyth Streets, Atlanta 3, Ga.
Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia.
Midwest Region: 5 South Wabash Avenue, Chicago 3, Ill.
Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin.
Southwest Region: 425 Wilson Building, Dallas 1, Tex.
Arkansas, Colorado, Kansas, Louisiana, New Mexico, Oklahoma, Texas.
Western Region: 821 Market Street, San Francisco 3, Calif.
Arizona, California, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming, Territory of Hawaii.

Pamphlets, posters, and leaflets can be secured on request from the Office of Distribution, War Food Administration, and other agencies and can be introduced into the plant program by the nurse. At the end of this bulletin is a list of such material, together with the names of the organizations from which it may be had.

How much can the plant nurse do to help the women learn to prepare adequate meals, and, what is more, to persuade them to eat them? How much can she do to awaken the interest of all the workers in better health through better eating?

Pamphlets, leaflets, and fliers should be made easily available to the women, to be taken home. They should give suggestions about meals, information about the kinds of food that are neeeded by the body, ways of preparing the food, and what constitutes a balanced diet. The extent to which the nurse should or can be responsible for seeing that these materials are distributed to the women will depend, again, on the kind of educational program the plant has. But it is important for her to urge their distribution and their use.

In talking to the women, whether individually or in groups, some primary facts about food can be given them. For instance, the nurse might explain:

—A good guide to follow in order to supply the body regularly with certain needed foods is the use of the "Basic 7" food groups. The Civilian Food Requirements Branch of the Office of Distribution, War Food Administration, lists these basic foods as follows, and suggests that foods from each group be included in the diet each day:

1. Green and yellow vegetables, raw, cooked, frozen, or canned.
2. Oranges, tomatoes, grapefruit, or raw cabbage or salad greens.
3. Potatoes and other vegetables and fruits.
4. Milk and milk products or cheese.
5. Meat, poultry, fish, or eggs, or dried beans, peas, nuts, or peanut butter.
6. Bread, flour, and cereals—natural, whole-grain, enriched, or restored.
7. Butter and fortified margarine.

—The right food can be ruined by the wrong preparation. The ways in which food should be prepared in order to preserve its value are not harder, and frequently are easier and quicker, than other ways. Easy guides to the busy woman worker are available and can be distributed.

—The woman who keeps an eye out for the foods that are in season, abundant, and on special sale can often plan a more nutritious and

less expensive meal than if she stuck to traditional menus without regard to limitations of supply.

—Above all, it is important to eat regularly and in sufficient amounts. All nurses who have worked in plants for any length of time know how generally women neglect or hurry their meals. Especially among those working on night shifts, there is a great tendency to be sketchy about eating. Adjustment to a regular way of living on the abnormal schedule of a graveyard shift is not always easy. Many women, fitting in household duties during the daytime, fail to have regularity in hours either of sleep or of meals. The necessity for regularizing their program cannot be too strongly stressed, since the failure to do this is the quickest and most likely way of failing to get the needed supply of the right kinds of food.

Eating facilities in the plant.—When the eating facilities of the plant come under the immediate supervision of the medical department, as they sometimes do, the nurse can keep an eye on them, with respect to both the kinds of food they offer and the cleanliness of the kitchen and the service. In any case she can urge the management of the cafeteria to offer the kinds of food the workers most need. At the same time she can point out to the workers themselves how important it is to make a proper selection of items as they go down the cafeteria counter. Details of the various problems of plant feeding should, of course, be in the hands of a trained nutritionist. When the size or organization of the plant does not permit the employment of a nutritionist, War Food Administration Office of Distribution industrial-feeding specialists should be called on to help with the problem. The nurse can encourage this practice by showing management its large part in protecting the efficiency and health of the workers.

There are a few points particularly relevant to the task of providing adequate food facilities. Among them are the following:

—There is some evidence to show that the worker (especially one doing heavy manual labor) often gets the lion's share of the family food supply. Therefore, if a good part of this need can be met in the plant cafeteria, there is likely to be a real improvement in the supply remaining for the rest of the family (28).

—That the work in the plant definitely improves when proper eating facilities are provided is attested by many employers. Here are a few of their statements (29):

> Production increased 10 percent due to improvement in morale in first two weeks after food service was set up according to recommendations of the Government's Nutrition in Industry Division.—Hugh Comer, executive vice-president, Avondale Mills, Sylacauga, Ala.
>
> Absenteeism was cut 19 percent in first four months following installation of our Nutrition in Industry Program, which includes serving of Victory Lunch Specials providing balanced meals supplying more than one-third of the daily food needs—Servel, Inc., Evansville, Ind.
>
> An adequate nutrition and feeding program is an important contribution to the health and safety program for the employees.—Craig Cochrane, manager, Industrial Relations Department, Eastman Kodak Co., Rochester, N. Y.
>
> We are meeting the need for changing food habits necessary under wartime rationing by serving more raw vegetable salads, more fresh vegetables and fruit, and milk, and weekly Meat Conservation Lunches in our 7 cafeterias and 35 mobile units which provide meals that follow Government recommendations.—John C. Becker, cafeteria manager, Curtiss Wright Plant, Paterson, N. J.

—The use of supplementary "snacks" between meals is believed to decrease fatigue, bolster morale, and increase production. An experiment (30) made on a group of women operators in a plant manufacturing rubber footwear showed an increase of about 10 percent in their production when the women changed from three to five meals a day. The amount of food eaten was not increased, but the intervals between meals were shortened. It is important that when such between-meal refreshments are made available they should be such as to have positive nutritional value—milk, citrus-fruit juices, fruits, tomato juice, sandwiches, and the like.

Haggard and Greenberg, who made this study, suggest the possibility of between-meals use of fruit or tomato juice (31). They point out that such juices contain vitamins and minerals, are readily digestible, and give prompt and definite increase in concentration of sugar in the blood. At the same time they are easy to handle in the factory, require no preparation, can be quickly consumed, and appeal to a wide range of tastes.

The use of sugar as a source of energy for industrial workers should not be encouraged, but rather the use of foods which have more essential food factors and a more prolonged effect (32).

—The lunch period should be sufficient to allow time for going to and from the cafeteria, washing the hands, eating without gulping, and to leave a few minutes for relaxation. A minimum of 30 minutes is necessary in spite of the fact that many plants actually have only 15 or 20 minutes for lunch. The nurse would do well to discourage the workers from eating while they are working or at their workplaces, and to encourage the management to supply suitable places and enough time for eating lunch.

That management itself is greatly concerned about this business of getting proper food for its workers is indicated in the pamphlet published by the National Association of Manufacturers (33), which describes the responsibility of management. According to this, leadership may be taken if management will—

1. Acquaint itself with the problem in its own plant.
2. Inform itself about the principles basic to proper diet.
3. Take five lines of attack:
   a. Educate the worker.
   b. Educate his family.
   c. Provide nutritious food in the plant.
   d. Cooperate with local restaurant owners to provide nutritious foods under sanitary conditions.
   e. Make nutritious foods available at low cost.

Personal hygiene.

Cleanliness.—To get clean and keep clean is no small achievement in many of today's industrial jobs. But personal cleanliness is one of the largest factors in dealing with some of the ills to which workers fall heir. For instance, the complete removal of irritating solvents from the hands is the main guard against dermatitis on certain processes. And scrupulous cleaning is an absolute must in the protection of radium dial painters and others working with radium. Many years ago, when industrial poisons and similar dangers were first making themselves apparent in growing American industries, there was a tendency on the part of some employers to disguise them for fear the workers would be reluctant to stay on the job or the plant would acquire

a bad reputation. Now industry makes a point of telling workers what hazards they may encounter on the job and how to protect themselves.

Here, of course, lies an important part of the nurse's job. Among the women new to industry, especially, the nurse is likely to find many who require particularly constant and firm guidance in the matter of protecting their persons against exposures to solvents, dust particles, fumes, and other sources of industrial disease. They may need to have stressed to them the part that careful and regular washing plays in protecting their health. Here is a considerable job of education to be done, and no one is in a better position to do it than the industrial nurse. However, there is no point in urging personal cleanliness unless the worker has a chance to practice it. The question of adequate washing facilities in the plant will be discussed in the next part of the report. (See p. 23.)

One thing that should be made clear to the workers is the possibility of carrying into their homes the dangers they encounter on the job. Dust or solvents on the clothes may contaminate the home. A woman who leaves a scaling gun or a filing bench to go home and cook dinner for her husband and children should make very sure that she leaves the dust and the metal behind her, too.

Care of the feet.—The "foot problem" is more serious for women than for men. Standing for long hours is very fatiguing to women and they may be susceptible to varicose veins. A report of 1,000 cases seen in a foot clinic states that there were 15 women to every man. Of these women, 33 percent had abnormalities of the forefoot, and 20 percent had flat feet. About one-third had severe corns, ingrowing nails, arthritis, or other such conditions. Many of those with forefoot deformities were under 30 years of age.

Lack of exercise, long periods of standing, and inadequate diet contribute to the problem. But a part of it arises from the habit of following unhealthy footwear fashions. High heels, narrow toes, absence of arch support, and thin soles add up to foot trouble. When unsuitable shoes are worn into the factory, where they are especially dangerous, the problem becomes serious.

When jobs require constant standing, rest periods should be allowed and seats be provided for the women. Very often jobs that are done standing could just as well be done while sitting; in such cases women should be allowed to alternate their positions. If this cannot be done, an attempt should be made to rotate the women on standing and sitting jobs, so as to afford some relief to all of them. Women who have foot ailments should be shown the need for proper medical care. Correctional exercises and treatment should be encouraged when they are needed.

One of the most important jobs of the industrial nurse is, of course, to sell the women the idea that broken-down party shoes, loose sandals, or other types of unsuitable shoes must not be worn in the factory. The appeal to the sense of fitness of proper types of shoes, as well as their comfort and safety, can be made a strong one. Moreover, the nurse can point out that sturdy and sensible shoes are especially advisable when rationing limits sharply the number that can be bought.

A safety program in the plant that insists on proper shoes—safety shoes when they are needed—is of major importance. The medical

director of a plant employing many women tells the story of one woman who was wearing a pair of old high-heeled party shoes in the plant. She lost both heels coming down some stairs, fell, and sat down so violently that her coccyx was broken. This incident was the focus of a safety-shoe campaign in the plant; the guilty shoes were paraded around on a truck, and from then on, low-heeled oxfords were the only working shoes allowed in the factory. It is not the part of wisdom, however, to wait until such things happen before dealing with an obvious danger.

Care of the teeth.—It has been stated (34) that many of the absences due to nonoccupational illness can be traced to bad mouth conditions. Thus it is very important, from the standpoint of production as well as that of health, to encourage adequate care of the teeth. At the time of beginning her employment, it would be well if the new worker could have her teeth examined and be told how much and what kind of attention they need. With the proper encouragement and follow-up, teeth can be repaired before they cause much damage and add to the already great sum of days lost because of illness.

In addition to the ordinary run of dental needs are the dangers caused by specific hazardous exposures. It is known that such substances as lead, mercury, phosphorus, and radium may have a far-reaching and destructive effect on the mouth, teeth, and gums. A chart prepared by Dr. Isaac Schour and Dr. Bernard G. Sarnat (35) shows the types of destruction caused by certain substances, and lists occupations that may be considered hazardous for this reason. Thus the importance of taking note of the slightest sign of injury or decay of gums or teeth should be made clear to workers exposed to such special dangers. And all workers, regardless of occupational risks, should learn to know the close relation between good teeth and good health. This means knowing it with conviction, so that they will act on the basis of their knowledge.

Care of the eyes.—The amount of eyestrain and the need for accurate vision involved on the job vary from one occupation to another. But certainly the well-being of the worker and efficiency on the job necessitate good vision and freedom from strain. Tests of eyes should be made that are suitable to the job. Thus, inspection work involving close visual examination will make certain demands on the eyes; operating a crane or driving a truck will make other demands.

The worker should be told when he is in need of corrective lenses, and urged to get them. If safety goggles are required, proper corrective lenses should be put in the goggles.

The Division of Labor Standards of the United States Department of Labor, through the National Committee for the Conservation of Manpower in War Industries, has instituted an important eye-saving program for industry. Through its regional representatives, lectures and demonstrations by a specialist in eye-protection are brought to the plants. Information about this program can be obtained from the Division of Labor Standards. It should be called to the attention of plant management by the nurse, if it is not already known. Advantage should be taken of this opportunity to develop an effective program of education on eye protection for both supervisory personnel and the workers.

The Division of Industrial Hygiene of the Public Health Service points out (36) the need to be concerned not only with protective

equipment and safety practices to guard eyes from injury on the job, but also with the development of standards for visual requirements in different types of occupation. Along with such standards must go examination of workers' eyes to determine what their condition is and to correct defects. The importance of interest and cooperation on the part of workers as well as management is great; and the industrial nurse can help to educate the worker to recognize the need for such a program.

Health in the home.

Of every 10 absences from work due to illness, 9 are due to causes not related to the work itself—illness such as everyone, regardless of his job, may be subject to. Consequently, it is not possible for the medical department to separate sharply the causes of illness and say that it will concern itself only with causes picked up on the job. Just as a worker may carry infection or disease from the plant to the home, so she may carry it in the other direction. Moreover, whatever the source, an absence is still a drain on the worker and a hindrance to production.

The woman who works all day on the job and runs her household as well needs all the help she can get to keep the health standard in her home high enough to protect her and her family from illness. Some plants have established a policy of home visits by nurses when workers are absent through illness. Others avail themselves of the help of visiting nurses from Public Health or other organizations. In either case a nurse going into the home will have an opportunity to assist directly with the health problems she may find there. If she does not visit the home, she must get from talking with the worker an understanding of what her home health problems are.

For more specific help the women can be directed to the medical, dental, and health clinics in their communities, to social agencies, to child-care centers or other groups organized to take care of local war emergency community problems, and to Government agencies such as the Public Health Department.

If there are women counselors in the plant, it should be their function to explore these possible outside services and to direct the women to them as needed. If there are no women counselors, the Personnel Department probably will be in a position to supply such information. In addition, there are in many areas nurses' organizations that can be of assistance in helping the women in the plant. (See pt. V for further discussion of this question.)

Mental hygiene.

On an earlier page it was mentioned that fatigue can develop from mental as well as physical causes; that the relation to her fellow-workers, her supervisor, and her environment has much to do with a woman's ability to produce efficiently. The reason for this lies in the fact, pointed out by Dr. Lydia G. Giberson (37), psychiatrist in the medical division of the Metropolitan Life Insurance Co., that—

> * * * the worker, regardless of mass effort or organization, will inevitably remain an individual and maintain his right to the dignity of an individual. * * * The individual is the man who counts.

Added to the task of adjusting to a wartime work program is that of facing the practical difficulties at home and in the community. The working woman struggles against problems of food, transportation, housing and service shortages. This, for the many thousands of inexperienced women now in industry for the first time, comes on top of the difficulties of a strange and demanding work environment.

Add again the personal and individual problems each person faces, and the fact that there are many workers who have considerable difficulty in dealing with them unaided. The sum total is, for some workers, tension and uncertainty that make them unable to keep going without costly effort. At this point, understanding and friendly counsel can be of immeasurable help. Some individuals may come near enough to the breaking point to need medical advice. When this need is apparent, the nurse should be able to discuss with the worker what kind of advice she needs, and show her where to get it. Others, with a chance to talk out their troubles and get some advice, will find themselves able to handle their problems. The nurse's place in this process of adjustment can be a very important one, if she sees and responds to the needs that will be shown. And as Dr. Sappington points out (38)—

> * * * morale has definite relationships to other important parts of an industrial health program, such as proper nutrition, fatigue control, and adequate and properly spaced recreation. No people can be expected to maintain top morale who are poorly nourished, who are tired and beset with physical and mental ills, and who do not have a reasonable chance to recover and recuperate through proper food, adequate rest, and simple recreative facilities.

IV. HEALTH AND SAFETY ON THE JOB

Responsibility for guarding the health and safety of women workers on the job belongs to many people in the plant: The production supervisors, the personnel department, the medical department, the safety department, and the workers themselves. The nurse can help the newcomer to understand the importance of this problem, and whether the specific factors involved are or are not her responsibility, she can recognize and point out their effects.

Instruction in health and safety should be a part of the induction training that is essential to the successful employment of inexperienced women. How much of this instruction falls to the nurse depends considerably on the size and the organization of the plant. This question will be discussed later. First must be examined some of the major factors involved, and how they come into the nurse's range of action.

HEALTH PROBLEMS IN THE PLANT

General health factors that carry over into the job.

The common cold.—A factory is as good a place as any in which to spread colds. Dr. W. M. Gafafer, in his outstanding long-term study of illness in industry (39), has indicated the great extent to which respiratory diseases contribute to sickness absenteeism. That colds do contribute considerably to sickness absenteeism is shown also by a number of other surveys. In one such study (40), a study in 1933 of over a million insured persons in England and Wales, there were tabulated 77,180 illnesses among men and 48,466 among women; of these, 23.5 percent and 23.8 percent, respectively, were due to colds, bronchitis, tonsillitis, and similar ailments. A third study (41), in Scotland in 1934–35, showed 8.8 percent of total illnesses among men and 12.4 percent among women to be due to colds, coughs, and tonsillitis. A further study of 5,500 persons over a period of 5 years (42) showed that among the men 32.9 percent, and among the women 42 percent, of all lost time due to illness was caused by colds, influenza, and tonsillitis. These figures indicate that women are somewhat more subject to such illnesses than men, and perhaps need more guidance in protecting themselves.

Thus it is important to watch for the signs of colds, and especially for the conditions within the factory that bring them on. Among other things, proper clothing is certainly a health factor, and one that women, more than men, are likely to disregard. Clothing must not only be safe, in that it does not offer hazards around machinery; it must be suitable to the weather and the working conditions. Working in a hot room, or in a cold one, or moving about from one to the other, demands suitable protective clothing.

If the nurse sees that the women are coming in for treatment for colds, she should find out if they are exposed to drafts, or are in poorly ventilated workrooms. One of the most effective ways of persuading management that action should be taken to improve such conditions is to show that these conditions are resulting in poor health and absenteeism.

Good food.—Part III explained the importance of the right kinds of food and of proper food services in the plant. If there is evidence that the women are failing to get the nourishment they need, it may be either that the means for getting it are inadequate or that the women have not become convinced that they do need it. The nurse may find that a better educational program seemed called for on the subject of food; or that those responsible for the cafeteria and other food services must be urged to make good food available.

Service facilities.—Both the health and the morale of workers are affected by the surroundings in which they work. The rest rooms and washing and toilet facilities available to women can play an important part in maintaining their good health and good spirits. It is obvious that with the great increase in the industrial employment of women there is need also to increase the provision of such services for them.

There are differences of opinion among employers about the use of rest rooms by women. In some plants no cots are provided. A matron may be stationed not only to keep the place clean but to act as policewoman in preventing loitering. Some plants have only toilets and washrooms for women, and no place in which they may rest. In others, it is a policy to allow women to lie down for a short time if necessary, and a suitable room with cots is provided. In still others, women are permitted to go to the dispensary or hospital if they must lie down.

Just what arrangements are best depends on the plant, its size, the number of women, the types of work they do, the size and arrangement of the dispensary, and so on. But it is a short-sighted policy to have no rest room for women workers. Very frequently a few minutes or half an hour of rest is all a woman needs to get her through the day's work without sacrifice of health or efficiency; and thus in many instances a day's absence is prevented.

The use of the dispensary or hospital cots for brief rest periods does not always prove desirable. Many plants with only first-aid stations or a small dispensary have no quiet room separated from the room in which injuries are dressed. In large plants the dispensary may be so far removed from many of the work stations that the women would have to take a 10-minute walk for the sake of a 10-minute rest.

It is important, therefore, that suitably located rest rooms and cots be provided; that these be kept clean; and that the women be permitted to use them as needed. Standards for space and cots in such rest rooms as approved by the American Standards Association may be taken as a guide (43):

Retiring and Dressing Rooms for Women

(*a*) Where 10 or more women are employed at any one time, at least one retiring room for their exclusive use shall be provided.

(*b*) Where less than 10 women are employed and a retiring room is not furnished, some equivalent space shall be provided which can be properly screened and made suitable for the use of women employees.

(*c*) The minimum space provided for a retiring room for 10 women shall be 60 square feet. The minimum increased space for more shall be at least 2 square feet for each additional woman employed.

(*d*) At least one couch or bed shall be provided in every place where more than 10 women are employed. The number of such beds or couches required shall be as follows: 10 to 100 women, one bed; 100 to 250 women, two beds; and one additional bed for each additional 250 women employed.

(*e*) Every dressing room shall be provided with separate clothes hook for every female employee.

Washrooms and toilet rooms must be adequate in number, well kept, and conveniently located. On the basis of field investigations the Women's Bureau recommends the ratio of 1 toilet seat to every 15 women employed (44). Standards for washing facilities as approved by the American Standards Association (43, Rule 3–15) provide for at least 1 lavatory, with adequate water supply, for every 10 workers up to 100 persons, and 1 for each additional 15 persons. They also recommend that for workers exposed to skin contamination by poisonous, infectious or irritating material, 1 lavatory with hot and cold water from the same faucet should be provided for every 5 persons. Twenty-four inches of sink with individual faucet is considered equal to one basin.

The responsibility for these facilities varies with the administrative and maintenance organization of plants. Though the plant nurse may not be responsible for them, she is responsible for seeing that the health of the workers is not endangered by lack of sanitary equipment or by inconvenience of its use. No matter who is in charge of these rooms, the nurse is able to use her position in relation to the plant's health program to see that they are adequate.

Health factors having to do with the job itself.

Physical strains.—A good deal has been said and written about the amount a woman should lift and how she should do it. Books and articles have discussed it. States have passed laws saying how much a woman may lift—amounts varying from 15 to 75 pounds. The Women's Bureau bulletin on this subject (45) indicates that carrying too heavy burdens, or carrying incorrectly, may have serious effects on the physical structure of women. Excessive lifting may aggravate menstrual difficulties. Deformities may develop that will cause trouble at childbirth. The effects of pregnancy, such as changes in respiration, pulse rate, composition of the blood, are likely to make a woman especially subject to injury by lifting during this period.

There are two ways in which the nurse can help to protect the women against strain from lifting. One is to teach them the proper way to lift. Often this subject is mentioned in a safety lecture, and a demonstration may even be made to show the difference between right and wrong lifting. But the women themselves must practice enough to get the feel of right and wrong lifting; otherwise it is likely to be merely a discussion without much meaning. The time is well spent in making sure that each woman understands both the technique of correct lifting and the consequences of bad lifting.

The second way is to see that excessive demands are not made with respect to the amount to be lifted. No arbitrary standard can be set for all women; those who are strong and muscular may be able

to lift as much as the average man, or more. Others find their limit in a much lighter weight. Further, the circumstances of lifting and carrying—how often, how far, whether up or down stairs, lifting from the floor or from a bench, lifting above the head—all these will affect the capacity of the lifter.

A woman may have to push a barrow or hand truck filled with material. She may pile lumber or sort scrap or load trucks, all jobs that may involve the handling of relatively heavy material. They involve also posture and changes of posture that may cause strain to the abdominal or the back or other muscles. When women on such jobs complain of physical strain, the nurse can help them by determining what the strain is, what causes it, how it can be removed. Or, if the women prove physically unequal to the jobs, she can help to get them removed to others more suitable.

Another possible source of health injury to be watched for is the use of pneumatic tools, such as pneumatic drills, air grinders, sanders, power wirebrushes, and riveting, scaling, or chipping guns. These vary considerably in weight, from small, very light implements to tools weighing up to 18 or 20 pounds. Naturally, the effects of the heavy tools are likely to be more serious than those of the light ones. The two main kinds of hazard they offer arise from the way in which the tools are held, and from the vibration experienced by the operator. Injuries arising from the former cause are more likely to occur in inexperienced workers, who are unfamiliar with the right way to hold the tool.

Injuries occur also, though very infrequently, to the joints, especially to the elbow of the arm holding the tool. Such injuries are thought to be due to the repeated shocks directly transmitted to this joint from the tool. Further injuries which may be especially serious to women may occur if the tool is held against the chest or the thigh.

Relatively little is known as yet about the extent to which women particularly are affected by the use of pneumatic tools. There is some indication that pelvic disturbances are aggravated, especially if the tools are heavy. There has also been some indication (46) that already existing menstrual irregularities may be heightened by the use of even light riveting guns; though the evidence relates to a small number of women and is not wholly conclusive. In some shipyards where women have been employed on chipping, which involves using heavy guns requiring great strength just to hold them properly in place, they have had to give it up. Scaling guns are used more extensively by women. Since they chip rust and paint from metal surfaces, and do not dig into the metal itself, their action is somewhat less violent than that of the heavy chipping guns.

Other possible sources of injury are noise and dust. The bad effects of these hazards, not peculiar to the users of pneumatic tools, should be watched for in anyone exposed to them.

Perhaps the most important safeguard with respect to the use of pneumatic tools by women is to select the right women for the job. This selection, together with proper adjustment of the job, will help to remove much of the hazard. In the opinion of a number of industrial hygienists who have studied the problem, certain recommendations should be considered when women are assigned to this kind of work. These are presented here.

Women with the following characteristics are best suited for work of this kind:
Above average in stature and muscular development.
The phlegmatic rather than the nervous type.
Having a history of normal menstrual periods.
Women with a history or clinical diagnosis of pelvic disorder, especially pelvic congestion, should not use vibratory equipment, even of the rotary type.
Pneumatic apparatus should not be used by pregnant women, by women who have had repeated pregnancies or abdominal operations, or by women with unusually large breasts.
Adjustments should be made in size and weight of tools for use by women. Women should not use heavy pneumatic equipment.
A sitting posture is preferable to an upright position.
If standing is necessary, rest periods in the prone or knee-chest position are recommended.
On periodic examination, women showing vasomotor disturbances, nervous or arthritic changes, should be transferred to other work.
Consideration should be given to change of job from time to time.
Counterbalancing, suspending, or propping tools should be done wherever possible to relieve operator of weight and vibration.
Women should not brace tools such as rivet guns against the chest. It is believed that following such practice might aggravate a tendency to develop cancer of the breast.
If the work involves production of silica-containing dusts, techniques for completely controlling them should be employed. This holds, of course, for all workers, men and women.

Posture.—In Part II the relation between poor posture and fatigue was discussed. As with lifting and carrying weights, the women should be taught how to relieve the strain of poor posture. Talks, simple demonstrations, and perhaps charts should be used to bring the point home.

It should be remembered that standing generally is hard on women in any case, and that constant sitting or standing may intensify existing menstrual troubles. When women are pregnant it is even more important that their jobs do not involve continuous standing.

The tools and the lay-out of the job.—Most machines used in industry were built for men. There are relatively few places in which the machines have been especially designed for use by women. Many of them are equally usable by both sexes; but there are others whose design does not fit structurally with the physical design of women. Perhaps the levers are too high for the shorter arm-stretch of most women. Perhaps the distance from floor to table is too great, and this may mean that a woman will have to stretch her leg constantly to manipulate a foot-pedal. Handles are made for a man-size grip, and women find them hard to hold on to, and harder to grip.

The results of such discrepancies may in some cases be strain and fatigue. The nurse is likely to encounter them in sickness absenteeism or the inability of women to perform their job. One industrial hygiene authority (47) has pointed out that—

> * * * a foot-pedal operator who has to strain unduly to reach the pedal may suffer from pelvic congestion with resulting harm to pelvic organs.

Such causes can be discovered as the nurse talks to the women, or as she explores the situations in which they do their work. For example, women welders have experienced some difficulty in manipulating the welding tongs; and there are now on the market tongs built narrower and longer than the usual ones to make the woman's grip more sure and at the same time to give the necessary leverage. Many other tech-

niques have been used, such as installing mechanical lifting and holding devices, extension levers, and conveyors. Though these practical questions concern the safety engineer and plant management, the nurse perhaps best of all can observe the effects of the strains that may arise from physical working conditions that are not adjusted to the women's build. It has often been found that such strains can be relieved by relatively simple devices and a little thoughtful planning.

Special health problems of women.

In discussing the physiological problems of women in relation to their work in industry, it is of the greatest importance neither to overestimate nor to underestimate them. On the one hand, unnecessary limitations may be set on the usefulness of women workers and on their opportunities for employment and advancement. On the other, definite harm may be done to a woman worker by allowing her to work under conditions or on jobs that are highly unsuitable for her. A fair attitude supported by sound medical advice will prove most productive and most satisfactory in dealing with the question.

Throughout industry there is a great deal of variety in the method of handling these questions. Policies range from completely ignoring them to setting up rigid regulations. It is important, therefore, to know exactly how much of an issue should be made of the various physiological matters that seem to affect the employment of women. This means trying to discover how much difference they actually make. With her particular relationship to the women workers, the nurse is in a position to find out part of the answer, at least, and to help to remove some of the difficulties that may be very real obstacles in the way of satisfactory employment of women.

A basic prerequisite for the protection of women, and also for placing them on jobs for which they are physically suited, is a good preplacement physical examination. Any defects that might limit a woman's ability to perform certain jobs should be discovered; and if they can be corrected, she should be urged to have that done for her own sake. Limitations in physical strength should be known before a woman is assigned to a job that might tax her beyond her abilities. At the same time, great care must be taken not to exclude a woman from work she is able to perform. The physical examination should be used solely as a technique for helping to determine the worker's highest physical qualifications and assigning her to the job they fit best.

Menstruation.—One of the reasons why some employers have been reluctant to employ women is that they anticipated periodic disability due to menstruation. This has been a matter of concern because of the desirability of maintaining the work efficiency of the women, and the possibility of injury to their health through the work they are given to do.

Two things should be remembered in considering this problem: First, that the discomfort that sometimes accompanies menstruation comes regardless of whether women work or not, and second, that there are industries that have for decades employed women, and these workers have remained steadily and productively on the job.

It may be true, however, that certain operations are generally harmful for women because they contribute to menstrual discomfort or disturbances, and that other operations are injurious only to some women. Earlier in this discussion, for example, the possible danger of using

pneumatic tools was mentioned. It is therefore desirable to separate two questions that are likely to be confused: To what extent does the work affect a woman's menstrual function? and to what extent is she subject to menstrual pain regardless of the job?

It sometimes happens that a woman who has not had any difficulty will begin to experience it when she starts on a factory job. After a history of regular and painless periods, they may become irregular, too frequent, longer or shorter than normal, or unnatural in other ways. Because the physiological function is closely related to emotional states, such conditions are often brought on by the tension, nervousness, and initial strain that rise from the new and strange conditions of the job. When the worker becomes acclimated, the tension eases off, she is more sure of herself and more at home, and the irregularities of menstruation may disappear.

Though menstruation is not, in itself, an industrial problem, it is true that women do lose time from work because of it. It is also true that in many plants certain simple steps have been taken that appear to relieve the discomfort and thereby reduce absenteeism. Therefore it is advisable for the nurse to find out how much menstrual troubles seem to affect the working efficiency of the women in the plant, and to consider the following remedies:

> The desirability of having cots in a quiet room where women can lie down for a brief period has been mentioned. This opportunity for relaxation is especially important for some women during the menstrual period, and has been found to contribute greatly toward a saving of time and efficiency in work.
>
> Some physicians recommend the application of a heat pad or the use of an infra-red heat lamp to relieve dysmenorrhea, and sometimes they give simple medication. These steps should of course be taken only under the instruction of the physician; but they have been found to be helpful.
>
> The use of physical exercises for the relief of dysmenorrhea is recommended by some physicians. These exercises, which are very simple, are designed mainly to correct posture defects that contribute to menstrual pain because of pressure on pelvic organs. A number of prolonged experiments with them have indicated a noticeable diminution of dysmenorrhea, and have been followed by lowered absenteeism rates from this cause. Sources of information about such exercises are listed at the end of this pamphlet. They should be used, of course, only under the guidance of the physician.

Perhaps the most useful thing that can be done to diminish this problem, and one that the plant nurse can do better than anyone else, is to establish a wise attitude toward it on the part of the women themselves. Physicians state repeatedly that much of the discomfort of menstruation is psychological, and stems from faulty health education. If this periodic process can be seen by the women as a normal healthy function and not as an affliction, it will be almost certain to cause them less distress. The fact is that a great many women do see it in this light, and many others can be persuaded to do the same.

A maternity policy in industry.—The question of the employment of pregnant women in industry concerns a relatively small proportion of women workers. But the problem appears to be of some moment

to employers at this time, for several reasons. The majority of working women are in the child-bearing years; because of the war many married women are working who otherwise would not be; and the inexperience of some employers with women workers causes them a bit of panic in the face of possibilities that they scarcely know how to handle.

To establish a maternity policy that will protect both the plant and the worker is not difficult. It can be done with mutual understanding; and the nurse can perform an important service in creating this mutual understanding. For one thing, it should be remembered that most women work because they have to; and that many times a woman who is a prospective mother may especially need to work. For this reason, employment should be made possible for her as long as she can work without injury to herself or her child.

Moreover, many physicians say that work, if it is not excessive in hours and does not involve exposure to hazards, usually is good rather than bad, at least during part of the pregnancy period. Dr. H. Close Hesseltine, speaking of the recommendations of the Committee on the Health of Women in Industry of the Section on Obstetrics and Gynecology of the American Medical Association (48), says—

> So far, there is no available data which would indicate that ordinary employment is detrimental to the early pregnant state in normal women.

It is the usual practice in plants not to hire women who are known to be pregnant; and it is almost equally common to discharge them as soon as pregnancy is discovered (49). Such a policy, however, encourages women to conceal their pregnancy as long as possible. Under such circumstances a woman may continue to work at a job or in a place that offers considerable hazard to her health and safety, and may make her a hazard to the people with whom she works. Moreover, the first three months of pregnancy, which are the most easily concealed, are also more precarious than the next three months. At this early date, then, women particularly need protection; but unless there is a policy in the plant that will encourage them to report their condition, they cannot avail themselves of protection. The plant also will profit from knowledge of the women's condition by assuring itself that women will be kept on suitable jobs and thus experienced workers will not be lost, and by being protected against the risk of accident among women doing heavy or hazardous work at a time when they are not fitted to do it.

Standards for such a maternity policy have been recomemended in a pamphlet published by the Women's Bureau and the Children's Bureau of the United States Department of Labor, listed at the end of this bulletin and available on request. It indicates the points that should be considered: The importance of judging each case individually; the time at which a woman should stop work before the birth of her child, and how soon afterward she may return to work; the types of jobs that should be avoided because of danger of physical strain or injury from toxic substances; the preservation of seniority rights, the opportunity to return to her job, the length of hours and rest periods, and other conditions of work.

One point perhaps should be emphasized. The transfer of a woman from a hazardous to a nonhazardous job is one way of enabling her to continue work during part of pregnancy, and of preventing the

loss to the plant of a trained worker. Such transfer must be made in accordance with plant policy, and on the advice of the physician who understands what the jobs entail and what the woman's physical condition allows. Otherwise, transfer is likely to depend on the will of the woman's immediate supervisor and be subject to a natural reluctance on his part to disturb his work set-up.

Throughout the process of establishing and using a good maternity policy, the nurse's role is central. From her personal knowledge of the women she can watch for cases that need attention. In her relationship with them she can encourage them to ask for and use the advice of their own and the plant physician, and can point out to them the importance of modifying their work program to fit the needs of the coming child. In her position within the administrative organization the nurse can urge on management the wisdom and the necessity of such a policy, and because her work in the plant is often more continuous than that of the physician she will be able to inform him of the cases that appear to need his attention.

One further point in relation to this subject should be mentioned. This is the fairly widespread rumor that women who do arc welding may for that reason become sterile. Medical evidence does not bear out this possibility. In answer to an inquiry on the subject, the National Institute of Health of the United States Public Health Service (50) points out that the main exposures in arc welding are to ultraviolet rays, ozone, oxides of nitrogen, and heat. None of these hazards will give rise to sexual impotence as the sole effect. A number of diseases, occupational or other, such as lead or benzene poisoning, typhoid or pneumonia, may result in a temporary diminution of sexual capacity; but this is believed not to arise in the absence of other characteristic features of the specific disease. Further, experiments to determine whether the light from arc welding gives off injurious rays, such as X-rays, have produced no evidence of any light-waves shorter than the ultraviolet in the arc. The best medical evidence indicates that radiation from arc welding cannot in itself produce injury to or destruction of the sexual organs.

The menopause.—The increase in the number of older women in industry has brought up the question of the menopause as affecting production. This, like menstruation, is not an industrial problem, and should be dealt with, if necessary, by the woman and her private physician. It too, however, may impress itself on industry by causing loss of time from the job and perhaps by a lessening of work efficiency. Therefore it is something that the plant nurse should be aware of if it arises among the women workers.

In general, physicians have pointed out that if there are no abnormal symptoms, such as would require medical attention, and no menopausal psychosis, the menopause is not a factor that needs be considered in the employment of women. When a woman is struggling with such disturbances, however, and finds difficulty in coping with her day-by-day problems, a considerate and understanding attitude can help her. Some physicians have suggested a change to light work requiring not much concentration or physical effort if the woman has been on a heavy or difficult job.

The attitude of the woman toward the menopause probably is a major factor in determining how she will continue her usual activities.

She should be helped to see it as an ordinary and normal process, and not as a break-down in her capacity for normal living.

In this, as in all matters relating to the health of the women workers, the nurse's greatest assistance to them may be summarized in two things: First, by her own interest and understanding building confidence in the medical department, so that the women will go for help when they need it; and second, by knowing the specific conditions in the plant that may help or hinder good health standards, and urging on those responsible the improvement of conditions that affect the health of the workers adversely.

Occupational diseases.

The danger of exposing workers to diseases arising from their work has always been serious in some industries. With the war, a number of factors have made it even more serious. One is the introduction of new materials, chemicals, or processes into a plant without time to discover first whether they carry with them any unknown hazards. Another is the great expansion of plants and of employment, which has taxed the safety facilities in industry, often beyond their capacity. A third factor is the inexperience of many new workers, who must learn to recognize the possible hazards of their jobs before they can be protected adequately against them.

The subject of occupational disease in industry is as complicated as the problem of fatigue and is highly technical. Even to define the term "occupational disease" is not easy. Does it refer exclusively to a disease for which a particular process is responsible, such as lead poisoning that comes from the use of lead in glazing pottery, for example, or does it cover also diseases arising indirectly from exposures, as a pneumonia resulting from working in cold, damp weather? There has been in recent years a tendency to widen the concept of occupational disease to include all diseases suffered as a consequence of work, whether directly or indirectly brought on. This tendency is shown in various State workmen's compensation laws, which are coming more and more to extend their coverage.

This report will not attempt to list the occupational diseases, nor to discuss their nature, their symptoms, or their effects on the worker. It is intended only to point out the fact that women are exposed to a variety of hazards of occupational disease, and that there are certain places where the industrial nurse should look for evidence of such hazards. From making felt hats to welding ships, the list of jobs is paralleled by a list of hazards. Of course, many of these hazards are adequately guarded against by plant engineering, good housekeeping, and personal protective equipment. And in many occupations they do not arise at all. However, the nurse should find out for herself, or from the medical officer and from the safety director, which of them exist in the work that women are doing in the plant. The Division of Labor Standards of the U. S. Department of Labor has issued an excellent guide (51) to occupational hazards, which is of great help to the nurse in identifying the effects of specific exposures. J. J. Bloomfield, of the Industrial Hygience Division of the United States Public Health Service, has pointed out (52) how the nurse can make a practical survey of occupations in her plant that might give rise to occupational diseases. If she keeps a record of such

occupations by plant department, she has a quick reference to possible causes for illness when women come into the dispensary. Sample forms issued by the Public Health Service, on which such records can be kept, and which can be adapted to the plant's needs, are obtainable from the Government Printing Office or from the local agencies offering nursing consultant services. These agencies are listed at the end of this pamphlet.

What are the kinds of diseases that attack workers through their jobs? The majority of them, it has been found, are of two types: Industrial poisonings and dermatoses (53). In addition (54), there are diseases arising from the following causes:

Abnormalities of air pressure, temperature, and humidity.
Dampness.
Defective illumination.
Dust.
Infection.
Radiant energy.
Repeated motion, pressure, shock, etc.

There are a number of published statements naming the various occupational diseases that arise from these causes. They give also information on how much exposure constitutes a hazard; the symptoms of the diseases, how frequently they occur in certain industries, what the consequences are to the workers, and how protection may be achieved. References to some of these sources are given at the end of this pamphlet.

Which of the causes mentioned above furnish a hazard to the workers with whom a nurse is concerned is something that she can find out only by knowing her own plant. When the women come to her for help, she should know not only what work they do but the conditions under which they work. With respect to possible poisoning, for example, the nurse should find out whether the women have been working with lead, mercury, benzol, or other substances that might produce symptoms of poisoning; whether they have been exposed to dust, fumes, or vapors that might harm them.

It should be remembered that working with such materials does not in itself constitute a hazard. If protection is adequate, the worker is safe. And responsibility for determining whether this is the case obviously rests with the safety experts. The importance to the nurse of knowing the facts about the conditions of work in the plant is that when a woman becomes ill some such hazard may be a source of the illness. The nurse's knowledge of the possible existence of the hazard may help to bring about a quicker cure and to prevent a recurrence.

Poisonous substances may be introduced into the body through inhaling, through the skin, or by way of mouth. Inhaling dusts, fumes, vapors, or gases is the most common way in which workers are poisoned. Sometimes workers handle dangerous materials and then handle food without washing their hands, or eat at their workbench and so ingest poisons with their food by way of mouth. Provision of proper washing facilities should be an invariable rule for such workers, perhaps supplemented by a prohibition against eating at the workbench. In some occupations, such as handling radium, inhalation is particularly dangerous; but carrying poisonous substances to the mouth through lack of careful washing of hands may also constitute

a hazard. Workers should be convinced of the importance of avoiding such practices.

One of the most helpful factors in protecting the women is to tell them what hazards exist in their jobs and how to guard against them. Further, they should be reminded frequently of their responsibility for being careful. The importance of safe work habits must be emphasized until they become second nature.

There has been much discussion about whether women are more susceptible than men to certain poisons. This is a question on which doctors themselves do not always agree. It is held by some, for instance, that women are more susceptible to lead and benzol poisoning than men are, and that in the case of lead they are more subject to the extreme type of poisoning that attacks the nervous system and the brain. Whether or not this is true, the important thing is to remove the hazard, so that no one, whether man or woman, will be exposed to it at all, to any harmful degree. The whole trend in present industrial safety practice is to do just this—to remove the source of danger rather than try to give individual protection to the person exposed to it.

Many women are in jobs that involve the use of oils, grease, and cleaning solvents. They may be running a lathe, which uses a coolant; they may be packing parts, first dipping them in a protective oil; they may be cleaning metals preparatory to painting or polishing. Such operations often get the hands into liquids that have a seriously irritating effect on the skin, sometimes developing one or another type of rash. Outbreaks of dermatitis are among the most common cases of occupational disease. Frequently they are not lasting in their effects, but even so they cause discomfort, pain, and loss of time from work. There are a number of protective lotions and creams designed to furnish protection of the skin against irritants. Which type is most effective will depend on the agent causing the trouble and on the particular susceptibility of the worker's skin, and these matters should be determined by the physician who knows these factors as well as the chemical nature of the protective substance.

Individuals vary considerably in their susceptibility to dermatitis, according to the texture of their skin, their pigmentation, and other factors. Nurses do well to watch for those women who are most subject to this disease, and to have them transferred to other occupations in which they are not exposed to it.

Much is being done to remove irritants from oils, lubricants, and solvents used in industry. But authorities on dermatoses make it clear that one of the most effective protections lies in exercising the greatest care in matters of personal hygiene. The women exposed to skin irritants should be convinced that careful hand-washing to remove such elements is absolutely essential as protection against dermatitis.

At the same time it should be remembered that in some instances a harsh soap does more harm than cutting oils. For this reason the soap supplied in the washrooms should be carefully chosen, and this is an item that the nurse can help to control. The medical officer will know what soaps are best for the purpose, and the nurse will know whether the women are finding the soap supplied irritating to their skins.

Sometimes hazards arise out of the conditions of work, rather than the exposure to certain substances. Do the women work out-of-doors in bad weather, or alternate between a heated room and the cold? Do they work in excessive heat, or dampness, or in poorly lighted or poorly ventilated rooms? These also are questions the answers to which will help the nurse to understand the ailments of women who need the help of the medical department.

SAFETY ON THE JOB

Within the past two decades the function of a safety program in industry has expanded greatly. Such programs are recognized as preventive measures; both worker and employer are concerned to prevent accidents. Safety is recognized as an integral part of plant operation; it is built into the plant and is related to all the operations and to all the conditions of work. The extent to which this is true varies, of course, from plant to plant. Some plants have as yet developed very little safety-awareness, whereas others have well established programs of accident prevention.

The responsibility for such programs rests, primarily, on the safety department. But everyone in the plant bears some of it. The nurse can contribute a large share toward building safety by recognizing and reporting the points at which special attention is needed, and by helping to develop safety mindedness in the workers. The importance of the nurse in this field is indicated by the fact that nurses are becoming increasingly interested in safety training. Safety training courses are being offered under the sponsorship of the United States Department of Labor and the United States Office of Education. In a number of cities industrial nurses are taking these courses, and find them effective in giving the basic facts about safety which the nurses need.

The need to be aware of safety problems.

Every new worker is a possible source of danger, to himself and to others, until he learns the elements of safety on the job. This is especially true of some of the women now coming into war plants, who have never had any association with factory conditions and have never been exposed to the kinds of hazards they present. Their complete lack of industrial experience and their general unfamiliarity with tools and machinery make it especially important in their introduction to the factory to stress safety. They must acquire a safety-awareness that can only be brought about by special effort on the part of those responsible for inducting them into the job.

This safety-awareness cannot be attained from a few minutes' talk on safety when the women first come on the job. It is the result of continued education. And the nurse is in a very strong position to help in this education. The women come to her when they are injured, or at other times when they are psychologically ready to listen to what is told them about safety.

The kinds of accidents that women have.

A woman working on an unguarded press had a finger cut off. After the accident, guards were placed on all the machines.

A woman got up to leave her machine. Walking across the floor she tripped over a chair and broke her arm.

A laborer climbed on a box to reach some material. The box tumbled, she also tumbled. The accident cost her 2 days of working time.

A packer unloading and lifting boxes sprained her back so severely as to keep her at home for a week.

Another laborer standing on a box that tumbled over received injuries to head, shoulder, and pelvic bone.

The operator of a lapping machine had some hair pulled out when it got caught in the machine.

A girl hurrying to her work across a parking lot fell and sprained an ankle.

A laborer fell over the tongue of a truck, suffering a fracture that disabled her for 54 days.

A woman operating an overhead electric crane in a shipyard climbed down the ladder from the cabin to the floor. The ladder had no rail. She was wearing "wedgies"—shoes with no heels. She slipped; her shoe could not catch on the rung because it had no heel; there was no hand-rail to grab. She fell to the floor and broke her arm.

A man working near the ceiling of an electric plant dropped a pipe. It struck a woman below, disabled her for over three weeks, and caused the loss of use of one finger.

On her first day at work a munitions handler in an ordnance depot was helping another woman to control the movement of 500-pound bombs down a conveyor. She decided that the bombs were moving too fast, and tried to slow them by putting her foot up against one of the crates containing the bombs. Her foot caught between the moving crate and the conveyor, and she fell off the platform. She lost 7 days of work.

The question why women have such accidents is complicated, but it must be asked if accidents are to be prevented. Obviously, many factors are involved. Some of these factors are personal, such as wearing improper clothing, doing things in a reckless way, being unskilled in handling the job or ignorant of its dangers, reluctance to follow safety rules, and so on. The munitions handler had been working less than a day; she might well be expected not to understand the ways of conveyors. With proper safety instruction new workers can learn what to look out for, and before they acquire that knowledge they can learn to be on their guard.

The accident to the crane operator was a combination of faulty clothing and faulty working conditions. If the ladder had been railed, and if she had had heels to her shoes, the likelihood of her falling would have been much less. And though she might be unable to do anything about the railing, she should have been instructed to wear the right kind of shoes and should have worn them.

Climbing on a pile of boxes, instead of on a set of steps or a ladder, is a good example of poor safety habits. So is working around moving machinery with unprotected hair, as the lapping-machine operator did. Other factors have to do with the working environment, such as the situation of the workman who dropped the pipe on a woman below; or the machine that was unguarded until someone lost a finger

on it; or the crane ladder without a railing. All these factors involve the need for responsibility on the part of management, first for setting up safe conditions in the shop, and then for safety education of the workers.

It must not be forgotten that many accidents, even those inside the plant, are not related to the specific work the women are doing. One of the most common types of accident to women is falling—falling on the street, on stairs, while walking through the factory. This fact is indicated by the report of temporarily disabling injuries for which women received workmen's compensation in Pennsylvania in 1941 (55).

Power machinery, such as drill presses, punch presses, sewing machines, accounted for about 21 percent of these injuries, or just over one in five. One in four were listed under "working surfaces," and four-fifths of these were injuries caused by floors and stairs—stumbling, tripping, falling. It seems clear from this that women have a safety problem in addition to that brought on by the machine or operation itself. Education is the only answer, education and training, which the nurse can help to secure for them.

As increased numbers of women are taken into industry, their age range necessarily broadens. More young girls and more older women are employed. The same Pennsylvania report shows that between 1939 and 1941 the number of girls 21 years of age and younger increased by almost 15 percent. The number between the ages of 22 and 40 was practically unchanged; and those over 40 increased by over 26 percent. These are changes in the numbers of women who had injuries on the job that disabled them for more than a week. The increasing number of accidents to women reflects, of course, the increase in their employment; there are more women exposed to the possibility of industrial accident. These figures, though including only statistics for the State of Pennsylvania, show the trend that is indicated throughout the country.

Because of the increased employment of women of all ages, it is to be expected that the proportion of industrial accidents that occur to women also will increase. This is supported by figures issued by the Industrial Commission of Wisconsin (56). Of all injuries reported to this commission, the proportions that were injuries to women rose between 1939 and 1943 as follows:

	Percent
1939	6.8
1940	7.1
1941	6.8
1942	9.3
1943	14.0

Even within the year 1943, an increase from quarter to quarter is noticeable. Percentages for the four successive quarters of 1943 were: 11.8, 13.2, 15.0, and 16.0, giving an average of 14.0 percent. This increase in accidents to women means chiefly, of course, that more women are employed. But it is also to be expected that they will do more and more of the hazardous jobs from which at first they were largely protected; and this will be an additional source of increased injury. That is why everything that can be done by the nurse to combat the injuries and illnesses of the women in the plant is of great value, not only to them but to the achievement of the fullest and most efficient production in the plant.

Helping the women to be safe.

Much that has been said on earlier pages about health problems can also be said about safety. In both instances the two strong bulwarks are, first, the acceptance by management of responsibility for good health and safety programs; and second, the education of workers to assume, in turn, their share of responsibility. The nurse can help in both these aspects: First, by calling to the attention of the proper authorities the information she can get from the women and from her own observation; and second, by taking an active part in educating the workers for health and safety. With respect to the safety problem itself, here are some of the points at which the nurse can be of use.

Safety clothing.—For most women clothes have always been a subject of intense interest; and generally women have come to accept certain traditional ideas about style and function of dress. Now more than ever new ideas are intruding themselves into this customary way of thinking. One of these ideas is *safety*. Hundreds of thousands of women are coming to judge their work clothing by whether or not it is safe to work in. This idea, new to so many women, takes some time to be firmly rooted; and though they are learning, they may need to be urged and persuaded to bring into practical use this notion of the special suitability of their clothing for their work.

Standards for work clothing have been described in the Women's Bureau Special Bulletin 3, Safety Clothing for Women in Industry, and detailed requirements have been established by the American Standards Association (see references). Private industry, the Army, and the Navy have all set up standards for the women who work in their factories, arsenals, shipyards, and other places. It is not necessary to describe here what the specific requirements are. But the nurse can see whether the clothes the women wear to work meet the safety standards of the plant. Further, if the plant does not have such standards, or if there is no rigorous application of them, she can urge that they be made an important part of a safety program. She can also talk to the women about the need for this, pointing out the specific places at which they risk injury through unsafe clothing. Sweaters or other loose garments, unsuitable and uncomfortable shoes, jewelry, flowing hair—these are the most obvious sources of injury.

Hazardous jobs.—Some women can undertake jobs with a certain physical risk better than other women can. Some are better at climbing; or they are stronger and can lift weights more constantly; or they can undertake relatively heavy clean-up jobs. Physical stamina is a requirement of a number of jobs in which women are employed, and those who are without it where it is needed are likely to suffer accidents. Other types of hazard require steady nerves and a calm disposition—as, for example, the handling of explosive materials or some of the pneumatic tools.

The placement of the right woman on the right job is, of course, the work not of the nurse but of the personnel department. But the final test of whether this is done lies in what happens on the job. The nurse is often in a better position than others—even than the foreman—to know when a woman is doing something that is beyond her power to do safely. In such circumstances the nurse should be able and ready to urge the transfer of women from the work they

are doing to something more suitable for them. If she knows what the jobs are, and the health and strength of the women who are doing them, and if she knows them understandingly, she can be of great assistance in pointing out assignments of work that carry with them special risks to the safety of the individual and perhaps of those working with her.

An open eye for bad spots.—In plants that are well supplied with safety inspectors or safety committees, hazardous working conditions generally are found out promptly. In departments in which foremen and other supervisors are well trained in the principles of safety, such conditions do not escape discovery. But in plants without a rigorously enforced safety program, or lacking trained personnel, there is a need for vigilance on the part of everyone. The nurse can contribute her share of this vigilance as she walks through the plant, keeping her eyes open for hazards that often are obvious but ignored. Safety manuals list them in detail. Among them are the effects of poor housekeeping such as crowded or narrow aisles, poorly placed materials, irregular floors that offer a tripping hazard, dangerously loaded trucks, dark passageways or corners, broken or unguarded stairs, inadequate or glaring lights. There are, of course, many others; but these are the ones most apparent on casual observation. Other dangers may be discovered from a study of the accident records in the dispensary or first-aid room. In many plants the study of these records is an essential part of the safety program; in others, they are used very little except in determining whether a person is fit to go back to work or in cases involving workmen's compensation. By reporting to management her own observations of any suspect conditions throughout the plant, and by making use of or urging the analysis of the records she keeps, a nurse can contribute greatly to the safety of the workers and to the efficiency of the plant.

V. TAKING PART IN A HEALTH AND SAFETY PROGRAM IN THE PLANT

Earlier sections of this bulletin have pointed out some of the specific problems that women workers face as they come into the plant, and ways in which the industrial nurse can help them to solve these problems. They deal with both the personal and the plant factors that contribute to good or bad health on and off the job; safety practices and the understanding of hazards; special physical or psychological characteristics that may affect the performance and continued efficiency of women.

A good many of these are matters that come up in the ordinary course of the nurse's contact with workers, as indicated earlier. It is important for the nurse to pick up whatever casual references to them a woman may make when she goes to the dispensary for some other reason. It is even more important to recognize these problems as contributing to the difficulties a woman may be struggling under though she does not speak of them. She may not realize their effect, or may be reluctant to bring them up. If the nurse knows what the circumstances of the work and environment are, and recognizes the possibility of health difficulties, she is often able to clear up the obvious trouble.

Even such enlightened observation on her part, however, is not sufficient. Unless plant management recognizes the importance of this service and builds a planned program for health and safety, the nurse's efforts are likely to have only sporadic and limited effect. Where such a program exists, her job should be incorporated into it. Where it does not, she needs to convince management of its importance in the attainment of a high standard of work performance and efficiency.

This part of the report is not intended to describe the total program that might be developed, which may differ widely from plant to plant. Many factors determine its form, in addition to the all-important one of management's interest. Among these factors are: Size of plant; kind of equipment; nature of work; existence of hazards; size and organization of medical department; organization of other departments, such as safety, training, and personnel; and relation between departments.

How much the nurse will be called on or be able to do, with respect to the program of the plant, will depend largely on these factors. A few of the more important points at which she can contribute may be indicated here:

1. In an earlier section of the report emphasis was put on the induction period as the time for introducing safety and health care to the new workers, especially to the women industrially inexperienced. It was pointed out that giving specific facts about the hazards involved on the job and the way of guarding against them must be an

important part of the induction program. These hazards are not only the conditions inherent in the job, such as weight-lifting, exposure to poisonous substances, or the operation of machinery. They include—though "hazards" may be too strong a word—the ordinary daily events that may develop health or safety difficulties on the job: Colds, lack of proper food or sleep, discomfort due to unsuitable clothing, the strangeness of the sights and sounds and smells of a factory, the awkwardness of handling new tools and going through new motions, unfamiliarity with the types of relationship set up in a shop. To acquaint the incoming woman with such of these factors as constitute health matters, and to show her how the nurse can help her to deal with them, is an important part in the induction program. The extent to which the woman is prepared for her job will have a good deal to do with how quickly and satisfactorily—to herself and to her employer—she can become integrated into the plant life.

Such work should be followed up in the day-to-day contacts with the women. Some of the ways in which this can be done are listed in the paragraphs following.

2. The knowledge gained by the nurse of plant conditions that need attention should be passed on to responsible management officials. This is especially necessary where there is no safety department or person specifically responsible for ferreting out unsafe or unhealthy conditions. It is necessary when, in their visits to the medical department, workers show signs of illness or injury arising from unsuspected sources—hitherto unexposed plant hazards.

The same thing can be said when the nurse has evidence that women are on jobs for which they are not physically suited, or which put an undue burden on their health and energy. She should be able to suggest transfers for health reasons when they seem necessary.

It is obvious that the working-out of this activity will vary with the structure of the medical department. If there is a physician only on call or only on part time, more of the responsibility for such action will fall on the nurse than if there is a full-time physician in the plant. Even in the latter case it will often happen that the nurse can learn directly from the workers their need for such aid. They will not always go to the physician for help; they may not be aware that they need it. Such cases can be brought to the physician's attention by the nurse, so that he can investigate more fully the condition of the worker and follow up with whatever action is appropriate.

3. In plants having a planned safety-and-health program, the nurse's understanding of and relationship with the women can be very helpful in dealing with problems calling for the cooperation of many departments and the working together of people with various functions, such as medical, safety, personnel, supervision, and training. Problems that arise in any of these fields very frequently have bearing on the others, and in order to integrate policy and action, conferences and discussions among the various people should be held. In such discussions the nurse can contribute to the understanding of the others the knowledge she has gained in her own field, and can show the workers' need for help on specific questions. It is important, for instance, for the safety engineer to know whether women find equipment difficult to manipulate for reasons of physical strength or size. The foreman should know which women in his department are especially

susceptible to dermatitis from a solvent used in some operation, so that he will assign less sensitive workers to that particular job. The personnel director should know that a general rundown condition is responsible for consistent absenteeism on the part of certain workers. Seldom are any of the factors affecting the health or efficiency of workers isolated from all other factors. Usually they are a combination of health, safety, supervision, and personnel, or at least of some of these. A free exchange of information about problems among those concerned with these various aspects of the plant functioning is necessary if fullest use is to be made of the special skills of each.

4. It is important to know the community resources in matters of health, in order to be able to refer the women to them as need arises. One of the most useful sources of aid and information is the industrial nursing consultant in the industrial hygiene division of the local department of public health or department of labor. About half the States have such service; and in the others the nurse can turn to the local medical association or nurses' organization to find out what can be done to aid the women in cases of specific health needs that go beyond the responsibilities of the plant medical department.

The appended list of industrial nursing consultants (p. 42) shows in which States such service is available. These consultants will discuss with industrial nurses the plant and the home-nursing problems that the women workers face, and will help either in dealing with them at the plant, if that is where they should be dealt with, or in finding the proper nursing, medical, or clinical help in the community for problems outside the jurisdiction of the plant medical department.

Other community agencies that it is important to know are the child-care, social welfare, and recreation services. The need to refer women to these services will, of course, vary considerably. Some of the factors that will determine this are: The kind of community in which the plant is situated, the relation of the plant to the community, and whether the women have recently come into the region to fill a labor need or are residents of long standing.

If there is a woman counselor in the plant, she will of course be the person to establish such community contacts for the women workers and advise them where they may receive help on their home problems. But where no woman counselor exists, the nurse is the logical person for the women to consult.

5. One of the ways in which the nurse can aid most fully in the plant-wide program is to encourage and take part in the various educational activities. Among these the following should be mentioned:

Health committees.—Safety committees made up in whole or in part of the workers are becoming more widely recognized as important in plant programs. Their value is twofold: First, they are extremely useful in creating and holding the interest of the workers in questions of safety; second, they give to plant management the benefit of the workers' ideas. Since the problems of safety closely concern the workers, because they are the ones who suffer when accident or illness occurs, their contribution to establishing a good record of safe practices can be considerable.

Health committees similar to such safety committees should be established. Because health problems in the plant are primarily the concern of the nurse, she can advocate and help to develop these com-

mittees and encourage the workers to participate in them. Women as well as men should be urged to take part in the work of the health committees. Women who have had no industrial experience will find this an excellent way of learning about the problems involved and what their own responsibility is. They also may be better able than men to bring out and to help in the solution of those health problems that most closely concern themselves.

Management, if not already agreed, should be induced to see the advantages of health committees as a technique for improving both the plant conditions and the workers' understanding of their own place in creating and keeping a high standard of health in the plant.

The plant paper.—A good medium for health propaganda is the plant paper. Articles on health, nutrition, safety, recreation, and exercise can keep these matters in the minds of the readers. Special series addressed to women workers can give information on the particular matters they are concerned with, such as food preparation, care of children, appropriate work clothing, and available community services for health and recreation. The nurse can supply many of the facts and ideas that go into such articles, or write them herself. Coming from her in her professional capacity, they probably would have special weight with the women who read them.

Leaflets, posters, pamphlets, and films.—References at the end of this study (p. 46) give sources for printed material in the form of leaflets and pamphlets carefully prepared to meet the needs of workers. Leaflets on food, for example, are designed to be easily read and to contain suggestions and recipes that are simple to follow. It is very important not to overburden the women, already beset by many responsibilities, with material which they have not the time, nor the energy, nor the interest, to use. But this material is not a burden, it is a time-saver.

Posters emphasizing simple health facts should be displayed on well-stationed bulletin boards. When safety or health committees are dealing with special problems over a period of time—a drive for the use of goggles, say, or care of colds, or eating well-balanced meals—posters covering these special subjects will add strength to the drive and will bring to the fore ideas to which workers are at the time particularly susceptible.

These are matters for which the nurse certainly will not be wholly responsible, but she can undertake to see that authentic health information is available and to bring out the information that deals specifically with the health problems confronting the workers in her particular plant. And if there is no one else with the drive and foresight to carry out such an educational program, it will amply repay effort on the nurse's part in terms of increased health-mindedness on the part of the workers.

State, County, and City Agencies That Offer Industrial Nursing Consultant Services

[As of May 1944]

California	Bureau of Industrial Health, California Dept. of Public Health, 2002 Acton St., Berkeley 2, Calif.
Los Angeles County	Division of Industrial Hygiene, Los Angeles County Health Dept., 808 N. Spring St., Los Angeles 12, Calif.
Los Angeles City	Division of Industrial Hygiene, Los Angeles City Dept. of Health, 116 Temple St., Los Angeles 12, Calif.
Connecticut	Bureau of Industrial Hygiene, Connecticut Dept. of Health, Hartford 1, Conn.
Georgia	Industrial Hygiene Service, Division of Preventable Diseases, Georgia Dept. of Public Health, Atlanta 3, Ga.
Illinois	Division of Industrial Hygiene, Illinois Dept. of Public Health, 1800 W. Fillmore St., Chicago 12, Ill.
Indiana	Bureau of Industrial Hygiene, Indiana Board of Health, 1098 W. Michigan St., Indianapolis 7, Ind.
Iowa	Division of Public Health, Engineering and Industrial Hygiene, Iowa Dept. of Health, Des Moines 19, Iowa.
Kansas	Division of Industrial Hygiene, Kansas Board of Health, 812 National Reserve Bldg., Topeka, Kans.
Massachusetts	Division of Occupational Hygiene, Massachusetts Dept. of Labor and Industries, 23 Joy St., Boston 14, Mass.
Michigan	Bureau of Industrial Hygiene, Michigan Dept. of Health, Lansing 4, Mich.
Mississippi	Division of Industrial Hygiene, Mississippi Board of Health, Jackson 113, Miss.
Missouri	Industrial Hygiene Section, Division of Public Health, Engineering and Industrial Hygiene, Missouri Board of Health, Jefferson City, Mo.
New Hampshire	Division of Industrial Hygiene, New Hampshire Board of Health, Concord, N. H.
New Jersey	Industrial Hygiene Service, New Jersey Dept. of Health, 637 Broad St. Bank Bldg., Trenton, N. J.
Newark City	Division of Industrial Hygiene, Newark City Dept. of Health, Plane and Williams Sts., Newark, N. J.
New York:	
Syracuse City	Division of Industrial Hygiene, New York Dept. of Labor, 766 Irving Ave., Syracuse, N. Y.
New York City	Industrial Hygiene Cooperative Unit, New York City Dept. of Health, 12–26 31st St., Long Island City 2, N. Y.

North Carolina	Division of Industrial Hygiene, North Carolina Board of Health, Raleigh, N. C.
Ohio	Industrial Hygiene Division, Ohio Dept. of Health, State Office Bldg., Columbus, Ohio.
Cincinnati	City Dept. of Health.
Oregon	Division of Industrial Hygiene, Oregon Board of Health, 410 Oregon Bldg., Portland 4, Oreg.
South Carolina	Division of Industrial Health, South Carolina Board of Health, Columbia 10, S. C.
Tennessee	Division of Preventable Diseases, Tennessee Dept. of Public Health, Nashville 3, Tenn.
Memphis	City Dept. of Health.
Texas	Industrial Hygiene Section, Bureau of Sanitary Engineering, Texas Board of Health, Austin 14, Tex.
Utah	Division of Industrial Hygiene, Utah Board of Health, Salt Lake City 3, Utah.
Vermont	Division of Tuberculosis and Industrial Hygiene, Vermont Dept. of Public Health, Burlington, Vt.
Washington	Division of Industrial Hygiene, Washington Dept. of Health, 1412 Smith Tower, Seattle 4, Wash.
West Virginia	Bureau of Industrial Hygiene, West Virginia Dept. of Health, 1584 Washington St., East, Charleston 1, W. Va.
Wisconsin	Industrial Hygiene Unit, Wisconsin Board of Health, State Office Bldg., Madison 2, Wisc.

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Metropolitan Life Insurance Co., Policyholders' Service Bureau, New York, N. Y.
Servel, Inc., Evansville, Ind.
Westinghouse Electric & Manufacturing Co., Mansfield, Ohio.